Claims

What is claimed is:

1. An endoscope comprising:

a hollow tube having a proximal end and a distal end and having a substantially annular cross sectional shape including a substantially hollow annular region;

a window disposed in an aperture of the distal end of said tube;

a lens train disposed proximate said window in the distal end of said tube;

a photodetector disposed proximate said lens train in the distal end of said tube wherein said photodetector includes a photosensitive element oriented to receive light through said lens train from a field of view outside said tube;

a handle coupled to the proximate end of said tube, said handle having a cavity region;

a plurality of fiber optic rods disposed about said tube, each of said fiber optic rods having a first end and a second end wherein the second end of said fiber optic rods are terminated at the distal end of said tube; and

a light source, disposed in the cavity region of said handle, wherein said light source is coupled to the first end of said fiber optic rods.

2. The endoscope of Claim 1 wherein said fiber optic rods are evenly distributed about the annular region of said tube to illuminate the field of view outside said tube.

3. The endoscope of Claim 2 wherein said photodetector is electrically coupled to a video system.

4. The endoscope of Claim 3 wherein said photodetector is a charge coupled device image sensor electrically coupled to the video system.

5. An endoscope comprising:

a first tube having a proximal end and a distal end;

a second tube having a proximal end and a distal end, wherein the distal end of said first tube terminates a predetermined distance from the distal end of said second tube and wherein said second tube is rotatable with respect to said first tube;

a lens disposed in an aperture of the distal end of the second tube;

a photodetector disposed in the distal end of said first tube; and

a prism disposed in the distal end of said second tube within the predetermined distance and between said lens and said photodetector wherein said prism has a first surface facing said lens and a second surface facing said photodetector.

6. The endoscope of Claim 5 wherein the distal end of said second tube terminates at a predetermined angle and the first surface of said prism terminates at a corresponding angle.

7. The endoscope of Claim 6 wherein at least a portion of the proximal end of said second tube is disposed about a portion of the distal end of said first tube.

8. The endoscope of Claim 7 further comprising a lens train disposed between the second surface of said prism and said photodetector, wherein said lens train is disposed in and coupled to said second tube.

9. The endoscope of Claim 7 further comprising a lens train disposed between the second surface of said prism and said photodetector, wherein said lens train is disposed in and coupled to said first tube.

10. The endoscope of Claim 5 wherein:

said photodetector is provided as a charge coupled device image sensor;

the distal end of said second tube is provided having an angular opening; and

said prism is provided having an angled first surface with the angle of the first surface of said prism corresponding to the angle of the opening of the distal end of said second tube.

11. The endoscope of Claim 10 further comprising a knob coupled to the proximate end of said second tube, wherein said second tube rotates in response to a rotation of the knob.

12. The endoscope of Claim 11 wherein said lens is provided having preselected light filtering characteristics.

13. A stereoscopic endoscopic viewing system comprising:

a first hollow tube having a proximal end and a distal end;

a first window disposed in an aperture of the distal end of said first tube;

a first lens train disposed proximate said window in the distal end of said first tube;

a first photodetector disposed proximate said lens train in the distal end of said first tube;

a control rod coupled to a first surface of said first tube;

a second hollow tube having a proximal end and a distal end, said second tube being coupled to and movable in response to said control rod;

a second window disposed in an aperture of the distal end of said second tube;

an second lens train disposed proximate said window in the distal end of said second tube; and

a second photodetector disposed proximate said lens train in the distal end of said second tube.

14. The endoscope of Claim 13 further comprising:

a handle coupled to the proximate end of said first tube;

a control knob disposed in said handle and coupled to the proximate end of said control rod, said control knob provided for rotating said control rod and retracting moving said control rod in a direction along the longitudinal axis of said first tube.

15. The endoscope of Claim 14 further comprising:

a plurality of fiber optic rods disposed about said first tube, each of said fiber optic rods having a first end and a second end wherein the second end of said fiber optic rods are terminated at the distal end of said first tube.

16. The endoscope of Claim 15 further comprising:

a light source coupled to the first end of said fiber optic rods.

17. The endoscope of Claim 16 wherein said light source comprises an illumination assembly disposed in a cavity region of said handle.

18. The endoscope of Claim 13 further comprising:

a plurality of fiber optic rods disposed about said first tube, each of said fiber optic rods having a first end and a second end wherein the second end of said fiber optic rods are terminated ~~at the distal end of said first tube; and~~

a plurality of fiber optic rods disposed about said second tube, each of said fiber optic rods having a first end and a second end wherein the first end of said fiber optic rods are terminated at the distal end of said first tube and a second end of the fiber optic rods are terminated at the distal end of said second tube and wherein the second end of the fiber otic rods disposed in said first tube are substantially disposed against the first end of the fiber optic rods in said second tube.

19. The endoscope of Claim 18 wherein the numeral aperture of said first and second fiber optic rods are selected such that light fed to the first end of said first fiber optic rods is coupled from the second end of the fiber optic rods in said first tube to the first end of the fiber optic rods disposed in the second tube.

20. An endoscope comprising:

a first hollow tube having a proximal end and a distal end;

a control rod coupled to a first surface of said first hollow tube;

a second hollow tube having a proximal end and a distal end said second hollow tube being coupled to and movable in response to said control rod;

a window disposed in an aperture of the distal end of said second tube;

a lens train disposed proximate said window in the distal end of said second tube; and

a photodetector disposed proximate said lens train in the distal end of said second tube.

21. The endoscope of Claim 20 further comprising:

a handle, having a bore therethrough, coupled to the proximal end of said first tube; and

a control knob disposed on said handle and coupled to the proximate end of said control rod for rotating said control rod and moving said control rod in a direction along the longitudinal axis of said first tube.

22. The endoscope of Claim 21 further comprising:

a plurality of fiber optic rods disposed about said first tube, each of said fiber optic rods having a first end and a second end wherein the second end of said fiber optic rods are terminated at the distal end of said first tube.

23. The endoscope of Claim 22 further comprising:

a light source coupled to the first end of said fiber optic rods.

24. The endoscope of Claim 23 wherein said light source comprises an illumination assembly disposed in a cavity region of said handle.

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25. An endoscope comprising:

a tube having a proximal end and a distal end;

a first lens disposed in the distal end of said tube;

a second lens disposed in the distal end of said tube proximate the first lens;

a photodetector disposed proximate said second lens in the distal end of said tube;

a first control rod disposed in said tube and coupled to said first lens for moving said first lens in a first direction along a longitudinal axis of said tube.

26. The endoscope of Claim 25 further comprising a second control rod coupled to said photodetector for moving said photodetector in a first direction along a longitudinal axis of said tube.

27. The endoscope of Claim 26 further comprising:

a photodetector frame in which said photodetector is disposed, said photodetector frame slidably disposed in said tube and coupled to said second control rod;

a first control means, coupled to said first control rod, for moving said first control rod; and

a second control means, coupled to said second control rod, for moving said second control rod.

28. The endoscope of Claim 26 further comprising a handle coupled to the proximal end of said tube wherein said first and second means for moving said first and second control rods are disposed about said handle.

29. The endoscope of Claim 28 further comprising:

a plurality of fiber optic rods disposed about said tube, each of said fiber optic rods having a first end and a second end, wherein the second end of said fiber optic rods are terminated at the distal end of said tube.

30. The endoscope of Claim 29 further comprising:

a light source coupled to the first ends of each of said fiber optic rods.

31. The endoscope of Claim 30 wherein said light source comprises an illumination assembly disposed in a cavity region of said handle.

32. A stereoscopic endoscopic viewing system comprising:

a first hollow tube having a proximal end and a distal end and having an outer surface with a flattened portion;

a first window disposed in an aperture of the distal end of said first tube;

a first lens train disposed proximate said window in the distal end of said first tube;

a first photodetector disposed proximate said lens train in the distal end of said first tube;

a control rod coupled to a first surface of said first tube;

a second hollow tube having a proximal end and a distal end and having an outer surface with a flattened portion, said second tube being coupled to and movable in response to said control rod;

a second window disposed in an aperture of the distal end of said second tube;

an second lens train disposed proximate said window in the distal end of said second tube;

a second photodetector disposed proximate said lens train in the distal end of said second tube; and

a plurality of fiber optic rods disposed about said first tube, each of said fiber optic rods having a first end and a second end wherein the second end of said fiber optic rods are terminated at the distal end of said first tube; and

a plurality of fiber optic rods disposed about said second tube, each of said fiber optic rods having a first end and a second end wherein the first end of said fiber optic rods are terminated at the distal end of said first tube and a second end of the fiber optic rods are terminated at the distal end of said second tube and wherein the second end of the fiber otic rods disposed in said first tube are substantially disposed against the first end of the fiber optic rods in said second tube.

33. The endoscope of Claim 31 wherein the numeral aperture of said first and second fiber optic rods are selected such that light fed to the first end of said first fiber optic rods is coupled from the second end of the fiber optic rods in said first tube to the first end of the fiber optic rods disposed in the second tube.

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